

Trend Study 14-6-99

Study site name: Harts Draw Reservoir .

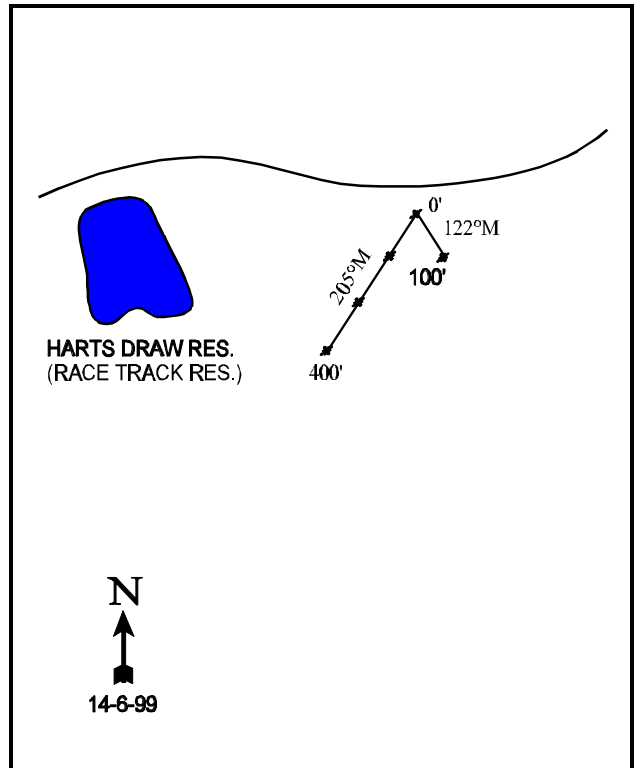
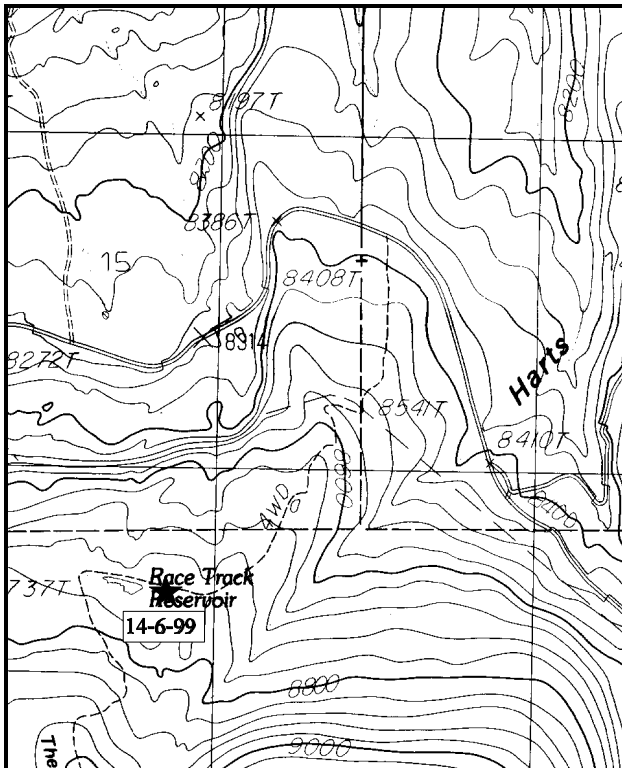
Range type: Mixed Oak-Sagebrush .

Compass bearing: frequency baseline 122°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the turnoff on the Blue Mountain Road to the Spring Creek Road by Monticello Lake (Spring Creek), proceed west on the paved road towards Foy Lake for 1.35 miles. Turn left (south) on a very rough dirt road and go up 1.05 miles to a point 200 feet east of Harts Draw Reservoir (Race Track Reservoir). From here, walk south 5 paces to the transect starting point, a 12-inch high red fence post. The frequency baseline runs southeast through the sage and small oaks to another red fence post. The first hundred feet run at 122°M. The rest of the baseline is doglegged off of the 0 foot and run at 205°M.



Map Name: Monticello Lake

Diagrammatic Sketch

Township 33S , Range 22E , Section 22

UTM 4195631.769 N, 632865.459 E

DISCUSSION

Trend Study No. 14-6 (35-6)

The Harts Draw Reservoir study is on National Forest land and within summer range for deer and elk. Aspen groves with oakbrush and sagebrush openings are the predominant vegetation types. The elevation is 8,800 feet with a north-northwest aspect and a slope of less than 5%. The area is part of the Harts Draw allotment (the Harts Draw unit is one of three on the allotment). The grazing system is rest-rotation; this unit is grazed for two months of the season for two years and rested the third year. Season of use is June 16 to Sept 15. The current agreement is for 361 head. The area was seeded over twenty years ago with no land treatments planned for the near future.

Considering its proximity to a water source, the area has received only moderate utilization of the grasses by cattle. Water is plentiful and grazing pressure does not appear to be concentrated in the immediate area of the water. Although access is easy, public pressure is low except during the hunting season. Deer pellet groups are frequent and deer have been observed on the site. Warm season escape cover is provided by thick clumps of oak and nearby groves of aspen. Pellet group data from 1999 estimate 18 deer days use/acre (44 deer days use/ha), 1 elk days use/acre (3 elk days use/ha), and 74 cow days use/acre (183 cow days use/ha). Nearly all of the cattle pats appeared to be from last season. About half of the deer pellet groups were recent with the other half from last year.

Soil in the area is moderately deep red-brown loam with an estimated effective rooting depth of nearly 18 inches and a slightly acid pH (6.4). The soil on the site is extremely compacted and difficult to dig in. As a result, stoniness measurements rarely hit rock and are more a measure of soil compaction. As evidenced by the very rocky, rough road leading to the site, the soil is susceptible to erosion. Once started by the removal of vegetation, erosion is rapid and severe. Gullies are found on the steeper slopes that are devoid of vegetation. Most of the study site has a thick protective vegetative and litter cover leaving little unprotected soil.

The sagebrush-grass type, which is closely intermingled with oakbrush, is a productive and highly utilized summer range. Mountain big sagebrush is the dominant browse species which had an estimated density of 5,399 plants/acre in 1986. This estimate has gone down to 3,100 plants/acre with the much increased sample size used in 1994. With the clumped nature of the population, the larger sample size gives a more realistic population estimate. The mainly mature population averages 1- 1½ feet in height and appeared to be in fairly good health in 1986, even though 28% showed poor vigor. In addition, 47% of the plants were classified as decadent. Plants looked fairly good with abundant seed production in 1986. Hedging on the plants was generally moderate to heavy with 42% showing heavy use. The sagebrush population in 1994 showed an increase in the proportion of plants, exhibiting poor vigor (43%) and decadence (78%). Over half (54%) of the decadent plants were classified as dying. This would equate to 1,300 plants/acre. Recruitment appeared good in 1994 with a biotic potential (proportion of seedlings to the population) of 36% with 7% of the population consisting of young plants. Utilization was mostly light. During the 1999 reading, the population declined slightly to 2,580 plants/acre. Percent decadence has declined to 42%. Utilization continues to be mostly light and vigor has improved. It appears that a large portion of the decadent and dying plants sampled in 1994 died, while some recovered and are now classified as mature plants. Many of the dead plants appear to have died within the past few years due to winter injury or some other sort of natural phenomenon. They did not appear utilized and many had old seed heads and fine stems (not showing clubbed appearance or signs of heavy use) still on the plants.

Oak on the site occur in isolated clones and vary in height from 4 to 10 feet. Density has remained rather constant since 1986 at around 4,000 stems/acre. Oak was mistakenly not included in the shrub density strips in 1994, so there are no density data. Utilization was moderate in 1986, especially on the abundant young sprouts around the edges of the clones. These showed some evidence of poor vigor and insect damage that year. Currently use is mostly light, vigor improved, and percent decadence low at 7%.

Two other shrubs, serviceberry and snowberry, are found in scattered populations. Both shrubs were moderately utilized in 1986. The snowberry had already started to loose its leaves in early September of 1986 when the site was first read. The serviceberry is especially vigorous and nearby six-foot tall shrubs provide abundant forage and seed.

Grasses and forbs are abundant in the understory, however two grasses dominate the herbaceous component. Smooth brome and Kentucky bluegrass each currently ('99) provide 20% cover and account for 100% of the grass cover, 66% of the total herbaceous cover, and 52% of the total vegetation cover. Other grasses are rare. Forbs are diverse but only lupine is common. It produced 60% of the forb cover in 1994 and 85% in 1999. Dusty penstemon was quite common in the past and was heavily hedged, as was redroot eriogonum. Both species have decreased in abundance in 1994 and 1999. Other important forbs are few flower peavine, paintbrush, wooly groundsel, and American vetch.

1986 TREND ASSESSMENT

Looking at data from both the older line intercept studies (LI) and the newer Interagency trend study (IA), these observations seem in order.

1. The oak and aspen-dominated areas are similar on all parameters between years. Diversity in species composition and forage production are high. The overall trend is stable.
2. The sagebrush-grass type, intensively surveyed with both methods, appears to be a more dynamic community. No severe fluctuations in the type were apparent, but there have been some changes.

	1981	1986
Browse production	188 lbs/acre	272 lbs/acre
Browse density	8,400 plants/acre	12,200 plants/acre
% of production from ARTRV	94%	85%
oak density	2500 plants/acre LI - 5600 plants/acre	IA - 5200 plants/acre
grass production	247 lbs/acre	360 lbs/acre

3. The soil is very erodible and where erosion has started, there is serious soil loss. However, most of the area has adequate cover in the form of a dense herbaceous understory and abundant litter. Soil trend is stable.

These data point to a trend of increasing oak, a possible decrease in big sagebrush and possible decrease in grass density. Comparison of photo point photographs also support these conclusions. Oaks are vigorously sprouting, while very little recruitment is found for the sagebrush, which also has a fairly high amount of decadence.

This area provides an excellent mosaic of big game habitat types, with cover, water, and forage all available. It is important to maintain the limited sagebrush-grass type for it is highly productive and heavily used by both big game and livestock. The increasing oak threatens the stability of this vegetation type. Therefore, trend is considered stable to declining.

1994 TREND ASSESSMENT

The trend for soil is up, because percent bare ground has decreased substantially and percent litter is still quite high with vegetative cover also being high. The browse trend is slightly down for the key species, which is mountain big sagebrush. The density estimate has gone down somewhat, but that is more reflective of the much larger sample size. What is of more importance is that the population has a much higher percent decadence (78%) and those showing poor vigor has increased to 43%. The one parameter that can turn this trend around is the large biotic potential which is 36% (2,160 seedlings/acre). The herbaceous understory trend is stable to slightly up with nested frequency values for both grasses and forbs having increased total values.

TREND ASSESSMENT

soil - up

browse - slightly down

herbaceous understory - stable to slightly up

1999 TREND ASSESSMENT

Trend for soil continues to be stable with excellent protective ground cover. Trend for browse appears to be in a state of decline for mountain big sagebrush. Although vigor has improved and percent decadence has gone down from 78% to 42%, the population density has gone down slightly, recruitment is poor, and the proportion of the population which are dead has doubled since 1994. Currently there are not enough young plants to replace decadent and dying plants. Gambel oak has remained at similar densities since 1986 (4,066 to 3,740 stems/acre) while increasing in size. Serviceberry and snowberry appear to have stable but small populations. Trend for the herbaceous understory is stable. Smooth brome and Kentucky bluegrass continue to dominate the herbaceous understory, yet they have remained with similar nested frequency values. The increase in Kentucky bluegrass since 1994 may be due to identification problems with mutton bluegrass. Even though nested frequencies of grasses did not increase, cover of the two dominant grasses doubled since 1994. This would be due to wetter conditions in 1999. Sum of nested frequency of forbs declined slightly, but the dominant forb, lupine, remained stable. Cover of forbs nearly doubled compared to 1994 estimates.

TREND ASSESSMENT

soil - stable

browse - slightly down

herbaceous understory - stable

HERBACEOUS TRENDS --
Herd unit 14 , Study no: 6

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'94	'99	'86	'94	'99	'94	'99
G	Agropyron cristatum	12	2	3	5	2	1	.01	.03
G	Bromus inermis	_a 301	_b 323	_b 336	94	95	100	8.02	20.12
G	Carex spp.	_c 54	_b 22	_a -	23	9	-	.43	-
G	Dactylis glomerata	-	-	2	-	-	1	-	.15
G	Poa fendleriana	_c 130	_b 68	_a -	49	25	-	2.01	-
G	Poa pratensis	_a 143	_b 270	_c 326	45	85	93	9.58	20.21
G	Sitanion hystrix	3	3	-	2	1	-	.00	-
G	Unknown grass - perennial	4	-	-	1	-	-	-	-
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		647	688	667	219	217	195	20.08	40.52
Total for Grasses		647	688	667	219	217	195	20.08	40.52
F	Achillea millefolium	-	-	3	-	-	1	-	.00
F	Androsace septentrionalis (a)	-	7	7	-	2	3	.63	.04
F	Antennaria spp.	_B 9	_{ab} 5	_a 1	3	2	1	.15	.15
F	Arabis spp.	_A -	_b 6	_a -	-	3	-	.01	-
F	Arenaria spp.	-	-	7	-	-	2	-	.30
F	Aster spp.	-	1	-	-	1	-	.00	-
F	Castilleja linariaefolia	6	8	13	3	6	6	.05	.25
F	Calochortus nuttallii	-	-	2	-	-	1	-	.00
F	Collinsia parviflora (a)	-	_b 19	_a 5	-	10	2	.05	.03
F	Crepis spp.	-	3	-	-	1	-	.63	-
F	Erigeron flagellaris	29	25	12	15	10	7	.07	.03
F	Eriogonum racemosum	_b 76	_{ab} 52	_a 27	30	22	13	.53	.50
F	Gayophytum ramosissimum (a)	-	_b 25	_a -	-	8	-	.04	-
F	Ipomopsis aggregata	_b 17	_{ab} 4	_a -	8	1	-	.63	-
F	Lathyrus pauciflorus	42	42	31	18	16	11	.79	.37
F	Lomatium parryi	_a -	_b 26	_a -	-	10	-	.87	-
F	Lupinus holosericeus	_a 178	_b 235	_b 244	76	86	90	7.76	17.11
F	Microsteris gracilis (a)	-	_a -	_b 51	-	-	21	-	.47
F	Penstemon comarrhenus	_c 138	_b 64	_a 7	66	29	5	.29	.07
F	Phlox longifolia	_a 16	_b 68	_a 30	7	26	15	.22	.07
F	Polygonum douglasii (a)	_a -	_c 31	_b 7	-	12	3	.06	.01
F	Senecio neomexicanus	_b 21	_a 7	_a 1	11	4	1	.02	.00
F	Taraxacum officinale	3	7	9	1	3	4	.01	.07
F	Thlaspi spp.	_B 12	_a -	_a -	6	-	-	-	-
F	Vicia americana	_a -	_a -	_b 44	-	-	18	-	.70
Total for Annual Forbs		0	82	70	0	32	29	0.78	0.56

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'94	'99	'86	'94	'99	'04	'09
	Total for Perennial Forbs	547	553	431	244	220	175	12.09	19.67
	Total for Forbs	547	635	501	244	252	204	12.87	20.23

Values with different subscript letters are significantly different at $\alpha = 0.10$

BROWSE TRENDS --

Herd unit 14 , Study no: 6

T y p e	Species	Strip Frequency		Average Cover %	
		'04	'09	'04	'09
B	Amelanchier utahensis	15	16	.55	1.37
B	Artemisia tridentata vaseyana	81	60	6.02	8.42
B	Quercus gambelii	1	37	8.86	5.94
B	Symphoricarpos oreophilus	24	13	1.02	.92
	Total for Browse	121	126	16.46	16.66

CANOPY COVER --

Herd unit 14 , Study no: 6

Species	Percent Cover
Quercus gambelii	.40

BASIC COVER --

Herd unit 14 , Study no: 6

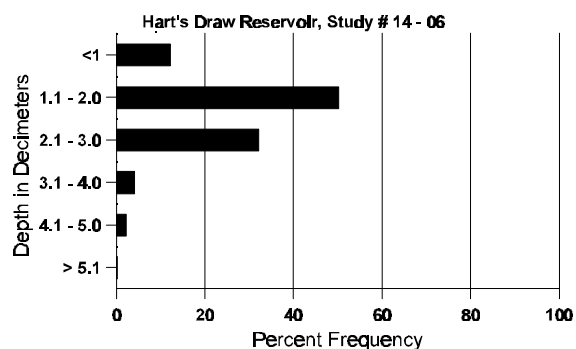
Cover Type	Nested Frequency		Average Cover %		
	'04	'09	'86	'94	'99
Vegetation	385	386	7.50	58.87	64.00
Rock	69	6	0	1.08	.04
Pavement	68	38	.50	.22	.12
Litter	391	387	76.00	57.97	67.18
Cryptogams	13	8	.25	.11	.12
Bare Ground	137	113	15.75	2.75	4.34

SOIL ANALYSIS DATA --

Herd Unit 14, Study # 06, Study Name: Harts Draw Reservoir

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
17.9	47.2 (18.1)	6.4	44.0	35.4	20.6	3.1	23.2	272.0	0.5

Stoniness Index



PELLET GROUP DATA --

Herd unit 14 , Study no: 6

Type	Quadrat Frequency		Pellet Transect Days Use/Acre (ha)
	'94	'99	
Rabbit	3	12	N/A
Elk	1	-	1 (2)
Deer	8	2	18 (44)
Cattle	2	11	74 (183)

BROWSE CHARACTERISTICS --

Herd unit 14 , Study no: 6

A Y G R E		Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Amelanchier utahensis																		
S	'86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'94	2	-	-	1	-	-	-	-	-	3	-	-	-	60		3	
	'99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	'86	-	14	1	-	-	-	-	-	-	13	2	-	-	1000		15	
	'94	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
	'99	5	1	-	1	-	-	-	-	-	7	-	-	-	140		7	
M	'86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	'94	2	2	-	4	-	-	-	-	-	6	2	-	-	160	39	8	
	'99	3	8	-	1	-	-	-	-	-	12	-	-	-	240	31	12	
D	'86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	'94	5	-	-	-	-	-	-	-	-	1	-	-	4	100		5	
	'99	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		93%			07%			00%			-64%							
'94		11%			00%			22%			+ 5%							
'99		47%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	1000	Dec:	0%			
												'94	360		28%			
												'99	380		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	104	-	-	-	-	-	4	-	-	108	-	-	-	2160		108	
	99	6	-	-	1	-	-	-	-	-	7	-	-	-	140		7	
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	11	-	-	-	-	-	-	-	-	10	-	-	1	220		11	
	99	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
M	86	-	27	16	-	-	-	-	-	-	32	6	5	-	2866	18 18	43	
	94	19	-	-	3	-	-	1	-	-	23	-	-	-	460	19 25	23	
	99	48	12	5	4	-	-	-	-	-	69	-	-	-	1380	20 23	69	
D	86	2	18	18	-	-	-	-	-	-	20	-	15	3	2533		38	
	94	102	3	2	14	-	-	-	-	-	55	-	1	65	2420		121	
	99	47	4	-	3	-	-	-	-	-	37	-	2	15	1080		54	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	800		40	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	1480		74	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		56%			42%			28%			-43%							
'94		02%			01%			43%			-17%							
'99		12%			04%			13%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	5399	Dec:	47%			
												'94	3100		78%			
												'99	2580		42%			
Quercus gambelii																		
S	86	6	11	-	-	-	-	-	-	-	9	4	4	-	1133		17	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160		8	
Y	86	-	26	10	-	-	-	-	-	-	5	15	14	2	2400		36	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	49	-	-	5	-	-	-	-	-	54	-	-	-	1080		54	
M	86	-	9	5	-	-	-	-	-	-	7	3	4	-	933	41 21	14	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	- -	0	
	99	87	31	-	2	-	-	-	-	-	120	-	-	-	2400	45 29	120	
D	86	-	4	7	-	-	-	-	-	-	4	-	2	5	733		11	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	11	-	-	2	-	-	-	-	-	11	-	-	2	260		13	
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	800		40	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		64%			36%			44%			-100%							
'94		100%			00%			00%			+99%							
'99		17%			00%			01%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	4066	Dec:	18%			
												'94	20		100%			
												'99	3740		7%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	86	1	2	-	-	-	-	-	-	-	-	-	3	-	200		3	
	94	1	-	-	-	-	-	1	-	-	2	-	-	-	40		2	
	99	1	-	-	2	-	-	-	-	-	3	-	-	-	60		3	
M	86	-	5	-	-	-	-	-	-	-	2	-	3	-	333	14	7	5
	94	14	2	-	9	3	-	-	-	-	23	2	1	2	560	15	22	28
	99	10	3	-	7	-	-	-	-	-	20	-	-	-	400	18	19	20
D	86	-	-	1	-	-	-	-	-	-	-	-	-	1	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'86		78%			11%			78%			+ 0%							
'94		17%			00%			10%			-23%							
'99		13%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'86	599	Dec:		11%		
												'94	600			0%		
												'99	460			0%		